Record of Decision
Remedial Action Areas 11 and 13
HALAWA-MAIN GATE GEOGRAPHIC STUDY AREA, JOINT BASE PEARL HARBOR-HICKAM, OAHU, HAWAII

PHNC National Priorities List Site

February 2013

Department of the Navy
Naval Facilities Engineering Command, Hawaii
400 Marshall Road
JBPHH HI 96860-3139

Comprehensive Long-Term Environmental Action Navy
Contract Number N62742-03-D-1837, CTO HC01

CONTENTS

TABLES

ACRONYMS AND ABBREVIATIONS

µg/L	microgram per liter
AR	Administrative Record
BEQ	bachelor enlisted quarters
bgs	below ground surface
Bldg.	building
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
cm/sec	centimeter per second
COPC	chemical of potential concern
CTO	contract task order
DOH	Department of Health, State of Hawaii
EAL	environmental action level
EPA	Environmental Protection Agency, United States
FFA	Federal Facility Agreement
FISC	Fleet and Industrial Supply Center
FS	feasibility study
ft/day	feet per day
ft/ft	foot per foot
GSA	geographic study area
JBPHH	Joint Base Pearl Harbor-Hickam
K	hydraulic conductivity
MCL	maximum contaminant level
mg/L	milligram per liter
MW	monitoring well
NAVBASE	Naval Base
NAVFAC	Naval Facilities Engineering Command
NAVSTA	Naval Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
no.	number
NPL	National Priorities List
NSC	Naval Supply Center
PHNC	Pearl Harbor Naval Complex
PP	proposed plan
PRG	preliminary remediation goal
RAA	Remedial Action Area
RAB	Restoration Advisory Board
RI	remedial investigation
ROD	record of decision
RSL	regional screening level
SARA	Superfund Amendments and Reauthorization Act
SRA	screening risk assessment
SUBASE	Naval Submarine Base
TDS	total dissolved solids
U.S.	United States
VC	vinyl chloride
VOC	volatile organic compound

1. Declaration

1.1 SITE NAME AND LOCATION

The United States (U.S.) Navy has prepared this record of decision (ROD) for the Remedial Action Area (RAA) 11 and RAA 13 sites located within the Halawa-Main Gate Geographic Study Area (GSA) at Joint Base Pearl Harbor-Hickam (JBPHH), Oahu, Hawaii (Figure 1). The RAA 11 and RAA 13 sites are part of the Pearl Harbor Naval Complex (PHNC) National Priorities List (NPL) site. The NPL identifies priorities among known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. PHNC is identified on the NPL as U.S. Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System Number (no.) HI4170090076.

This ROD has been prepared for the Naval Facilities Engineering Command (NAVFAC) Hawaii under the Comprehensive Long-Term Environmental Action Navy (CLEAN) III program, contract no. N62742-03-D-1837, contract task order (CTO) no. HC01.

1.2 STATEMENT OF BASIS AND PURPOSE

This ROD presents the Selected Remedy for the RAA 11 and RAA 13 sites located within the Halawa-Main Gate GSA at JBPHH, Oahu, Hawaii, which is in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Contingency Plan (NCP). This decision is based on the Administrative Record (AR) for RAA 11 and RAA 13.

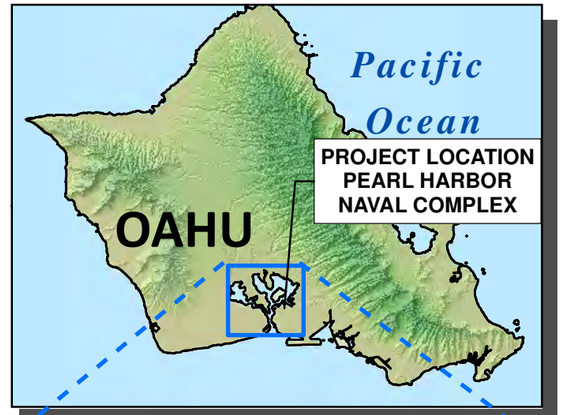
1.3 DESCRIPTION OF THE SELECTED REMEDY

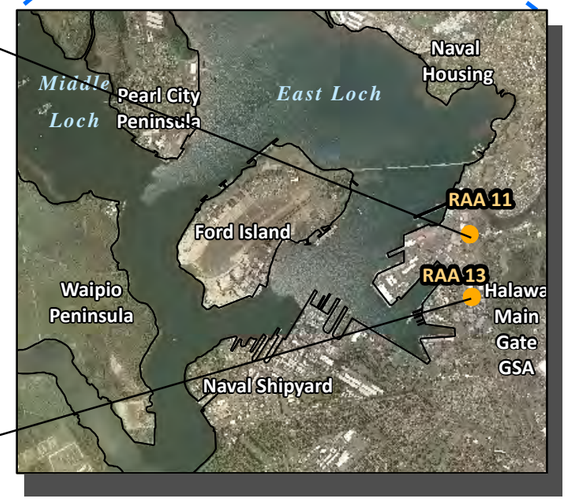
The selected final remedy for this ROD is No Action.

The Navy and EPA Region 9, with concurrence from State of Hawaii Department of Health (DOH), have selected No Action as the final remedy for the RAA 11 and RAA 13 sites. This decision is based on results from previous investigations (Section 2.2).

1.4 STATUTORY DETERMINATIONS

The remedial investigation (RI) report (AECOM 2011a) summarized the various environmental investigations for RAA 11 and RAA 13 at JBPHH. Based on the results of the human health and ecological risk assessments, the Navy has determined that no remedial action is necessary to ensure protection of human health and the environment. The Selected Remedy is protective of human health and the environment.





LEGEND

- Remedial Investigation Area
- Former Upper Tank Farm Aboveground Storage Tank

NOTES

1. Map projection is in Hawaii State Plane Zone 3, NAD83.
2. Basemap and inset mapsource: U.S. Geological Survey Hawaii Data Clearinghouse.

N

0 250 500 1,000 Feet

Figure 1
Remedial Investigation Site Map
Record of Decision
Remedial Action Areas 11 and 13
PHNC NPL Site
JBPHH, Oahu, Hawaii

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1.5 SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF FINAL REMEDY

The Navy and EPA Region 9, with concurrence from the DOH, have selected No Action as the final remedy for the RAA 11 and RAA 13 sites. This remedy is protective of human health and the environment at the RAA 11 and RAA 13 sites located within the Halawa-Main Gate GSA, which is part of the PHNC NPL site at JBPHH, Oahu, Hawaii.

2/14/13

J. W. James
Captain, U.S. Navy
Commander
Joint Base Pearl Harbor-Hickam

Date

3/29/13

Michael M. Montgomery
Assistant Director, Federal Facilities and Site Cleanup Branch
Superfund Division, U.S. EPA Region 9

Date

The State of Hawaii DOH concurs with the selected remedy as documented in this ROD.

4-7-13

Keith E. Kawaoka, D. Env.
Program Manager
Hazard Evaluation and Emergency Response Office
State of Hawaii, Department of Health

Date

2. Decision Summary

This section summarizes the site description, site history, previous investigations, response actions, current site characteristics, land and resource uses, and current site risks. In addition, this section provides the response action objectives and the rationale for selecting the final remedy for the RAA 11 and RAA 13 sites.

2.1 SITE NAME, LOCATION, AND DESCRIPTION

The JBPHH is an active military installation owned and operated by the Navy, located in the southern portion of the Ewa Plain, approximately 2.9 miles southeast of Pearl City, Oahu, Hawaii and 5.8 miles northwest of downtown Honolulu (Figure 1).

The Halawa-Main Gate GSA comprises approximately 595 acres on the east side of Pearl Harbor, and is bounded by Halawa Stream to the north; East Loch and Magazine Loch to the west; Kamehameha Highway to the east; and Makalapa Road to the south. RAA 11 and RAA 13 represent two of the 13 RAAs within the Halawa-Main Gate GSA.

The Halawa-Main Gate GSA encompasses three principal entities: Fleet and Industrial Supply Center (FISC), Naval Submarine Base (SUBASE), and Naval Station (NAVSTA). The first submarines to operate from the area arrived in 1916, and were berthed at Magazine Island. The SUBASE was officially commissioned in 1920, and the first permanent building was constructed in 1923. In 1924, construction commenced on Sierra Piers 6 through 9. By 1925, about 25 permanent buildings had been constructed. The expansion of SUBASE Pearl Harbor reached its peak in 1944, when there were 6,633 personnel serving the base. Magazine Island was connected to the mainland with dredge spoils during World War II (1940 to 1943).

In January 1946, the north portion of the GSA was commissioned as the Naval Supply Center (NSC) Pearl Harbor. The NSC was renamed the FISC in March 1993. Prior to its development, the area consisted of the island, swampland, kiawe trees, and coral roads.

NAVSTA began in 1912 as the receiving ship at Hospital Point. In 1937, it was transferred to a small barge near the SUBASE where it remained until 1940. At this time, it was renamed Receiving Station and relocated to Building (Bldg.) B150, its present Headquarters. In 1955, the Receiving Station was established as NAVSTA Pearl Harbor. NAVSTA provides support to the operating forces of the Navy, dependent activities, and other commands as assigned (Earth Tech 2002).

RAA 11. Located within the FISC in the northeastern portion of the Halawa-Main Gate GSA, RAA 11 is on the south side of Bldg. 550 (former District Publication and Printing Office, and current Defense Logistics Agency Document Services Pacific Office) and adjacent to the tennis courts. No volatile organic compounds (VOCs) were detected in groundwater samples collected from any of the other monitoring wells near monitoring well (MW)13, leaving it as the only monitoring well associated with RAA 11. No VOCs were detected from soil samples collected during drilling and installation of MW13, or any other of the nearby monitoring wells. As a result, the site boundaries of RAA 11 are limited to MW13. The location of RAA 11 is shown on Figure 2.

RAA 13. Located within the NAVSTA in the central portion of the Halawa-Main Gate GSA, RAA 13 is in the parking lot of the Bachelor Enlisted Quarters (BEQ) (Bldg. 1330). No VOCs were detected in groundwater samples collected from any of the other monitoring wells near MW43, leaving it as the only monitoring well associated with RAA 13. No VOCs were detected from soil samples collected during drilling and installation of MW43, or any other of the nearby monitoring

wells. As a result, the site boundaries of RAA 13 are limited to MW43. The location of RAA 13 is shown on Figure 3.

Executive Order 12580 authorizes the Department of the Navy, as the lead agency, to conduct environmental response actions at Navy sites such as RAA 11 and RAA 13. EPA Region 9 and DOH have provided oversight during environmental investigations.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

MW13 and MW43 were initially investigated under the CLEAN I Program, CTO no. 0039 and addressed as part of the Naval Base (NAVBASE) Subsurface Fuel RI/feasibility study (FS). These wells were identified as remedial action areas and recommended for further evaluation when vinyl chloride (VC) concentrations were detected in the groundwater associated with MW13 (RAA 11) (93 micrograms per liter [µg/L]) and MW43 (RAA 13) (6 µg/L) above the DOH action level of 0.02 µg/L and ecological screening criteria of 0.95 µg/L, respectively, for VC. MW13 (RAA 11) and MW43 (RAA 13) have been sampled as part of several groundwater investigations and sampling events, as listed in Table 2-1, and as described in the following sections. No CERCLA enforcement actions have been issued for either RAA 11 or RAA 13.

2.2.1 1994 – 1997 NAVBASE Subsurface Fuel RI/FS

MW13 and MW43 were investigated as part of the NAVBASE Subsurface Fuel RI/FS, which was conducted and reported in two phases, Phase I (Ogden 1994) and Phase II (Ogden 1997). Soil borings conducted in proximity to Bldgs. 550 and 1330 were converted into groundwater monitoring wells MW13 and MW43, respectively. Groundwater samples were collected from each monitoring well for the purpose of assessing the nature and extent of petroleum-related soil and groundwater contamination within the NAVBASE Pearl Harbor project site (Ogden 1994, 1997).

RAA 11 and RAA 13 were identified during the NAVBASE Subsurface Fuel RI/FS as areas recommended for response action based on VC concentrations detected in groundwater above the DOH action level of 0.02 µg/L and ecological screening criteria of 0.95 µg/L, respectively, for VC that were in place at the time. VC was detected in the groundwater samples collected from MW13 (RAA 11) at a concentration of 93 µg/L and MW43 (RAA 13) at a concentration of 6 µg/L. No VOCs were detected in groundwater samples collected from other monitoring wells near RAA 11 and RAA 13. The NAVBASE Subsurface Fuel RI/FS Report recommended[1] that quarterly groundwater sampling and analysis be performed for 1 year at RAAs 11 and 13 (Ogden 1997).

Soil analytical data for RAAs 11 and 13 are limited to soil sampling results obtained from the Subsurface Fuel RI/FS (1994-1997). Soil samples were collected from soil borings subsequently converted to MW13 and MW43 as well as nearby locations during the drilling of temporary groundwater sampling points and during the drilling and installation of more permanent monitoring wells. No detections of chlorinated VOCs were reported in any of the soil samples (Ogden 1994, 1997).

As a result, no additional soil sampling was conducted. Soil analytical results from RAAs 11 and 13 and adjacent locations are presented in Attachment B, Tables B-3 and B-4.

[1] Text in blue font identifies where detailed cross-reference site information is available (Attachment A). In the event of any inconsistency between the text in this ROD and the text in any of the cross-reference documents, the text in this ROD will take precedence.

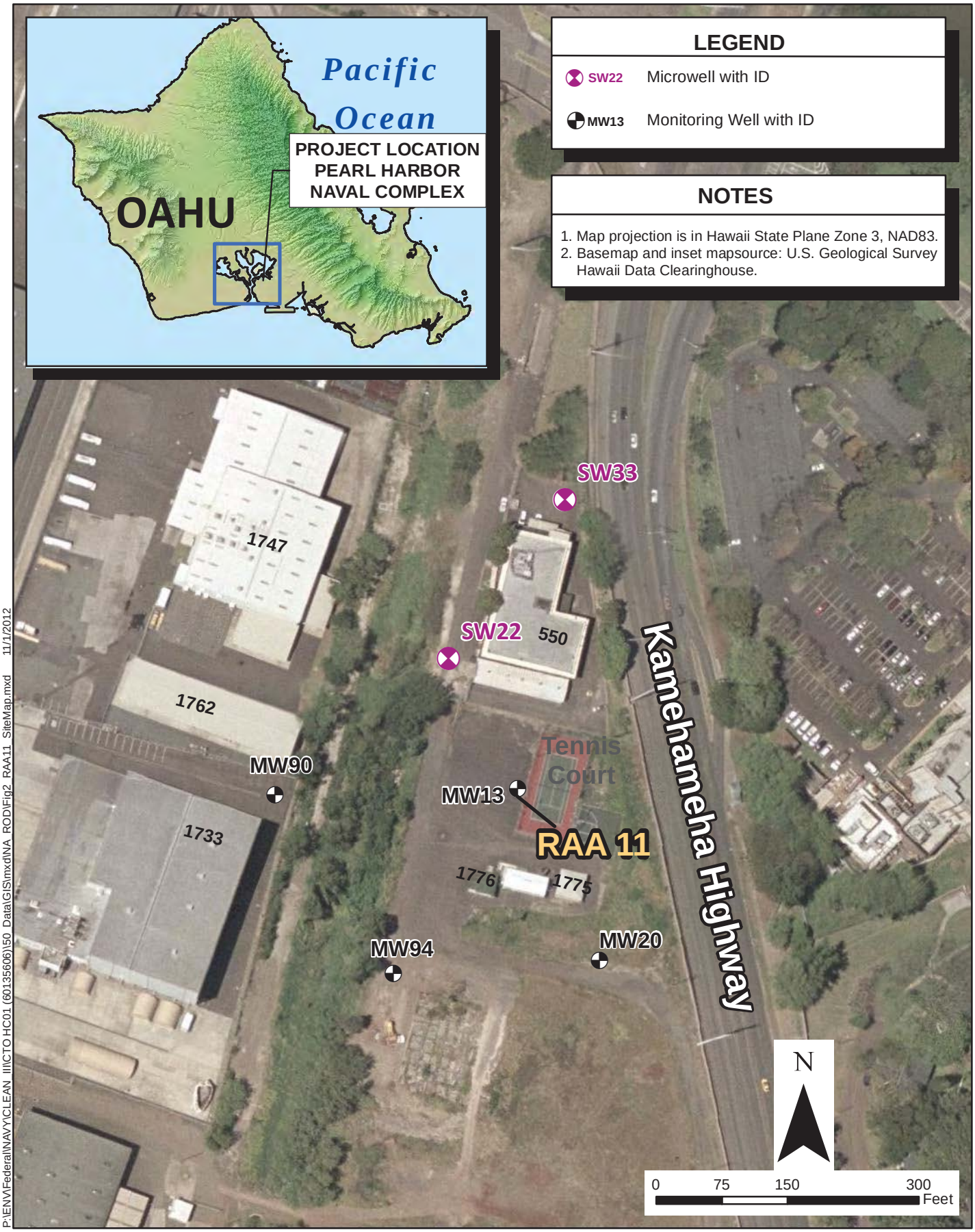

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Figure 2
RAA 11 Site Map
Record of Decision
Remedial Action Areas 11 and 13
PHNC NPL Site
JBPHH, Oahu, Hawaii

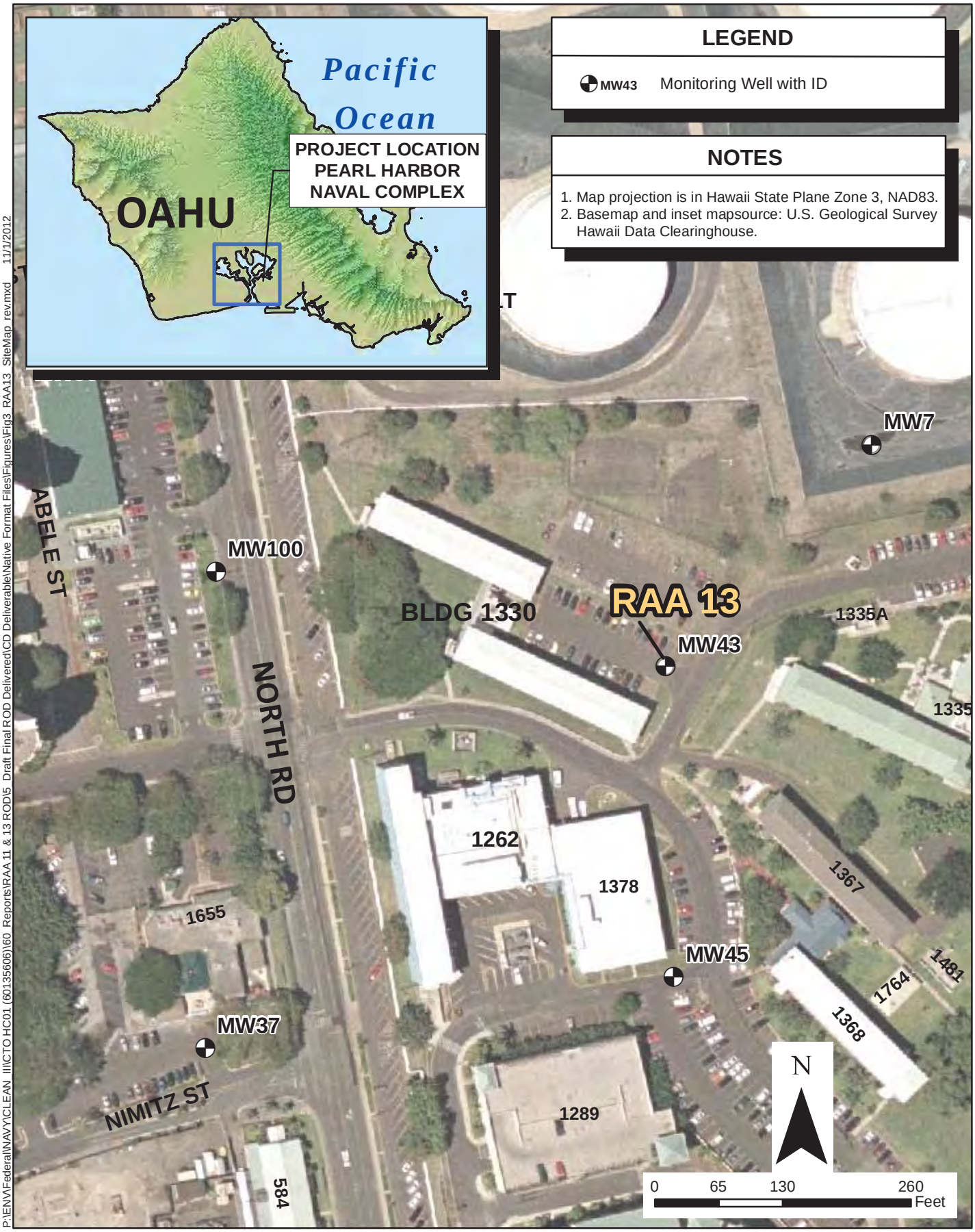

Figure 3
RAA 13 Site Map
Record of Decision
Remedial Action Areas 11 and 13
PHNC NPL Site
JBPHH, Oahu, Hawaii

Table 2-1: Project History, Remedial Action Areas 11 and 13

CLEAN Program	Project	Scope of Work	Document
CLEAN I CTO 0039	Subsurface Fuel Remedial Investigation (RI) and Feasibility Study (FS)	Investigation into the potential impacts of suspected fuel releases across the approximate 400 acre NAVBASE project area comprising FISC, NAVSTA, and SUBASE.	*RI/FS for Subsurface Fuel Investigation, Naval Base (NAVBASE), Pearl Harbor, Hawaii* (Ogden 1997)
	Quarterly Groundwater Monitoring	Based upon recommendations of the RI/FS (Ogden 1997), Quarterly Groundwater Monitoring was conducted for one year at MW13 (RAA 11) and MW43 (RAA 13), with samples collected in September 1997, December 1997, March 1998 and June 1998.	*Quarterly Ground-Water and Product Monitoring Summary Report (September 1997–June 1998) for the Subsurface Fuel Investigation, Naval Base Pearl Harbor* (Ogden 1998a)
			Monitoring Summary Report revised per Lewis Mitani, EPA Region 9 review comments dated 18 February 1999 *Revised Quarterly Ground-Water and Product Monitoring Summary Report (September 1997–June 1998) for the Subsurface Fuel Investigation, Naval Base Pearl Harbor* (Ogden 1998b)
	Annual Groundwater Monitoring	In a response to EPA Region 9 concerns, annual groundwater monitoring was initiated in June 1999 for both RAA 11 and RAA 13.	*Annual Ground-Water Data Package, Subsurface Fuel Investigation for Naval Base (NAVBASE) Pearl Harbor* (Ogden 1999)
		Annual groundwater monitoring conducted in May 2000 for RAA 11 and RAA 13.	*Annual Ground-Water Data Package, Subsurface Fuel Investigation for Naval Base (NAVBASE) Pearl Harbor* (Ogden 2000)
		Annual groundwater monitoring conducted in February 2001 for RAA 11 and RAA 13.	*Annual Ground-Water Data Package, Subsurface Fuel Investigation for Naval Base (NAVBASE) Pearl Harbor* (Ogden 2001)
		Annual groundwater monitoring conducted in June 2002 for RAA 11 and RAA 13.	*Annual Ground-Water Monitoring Data Package, Subsurface Fuel Investigation for Naval Base Pearl Harbor* (AMEC 2002)
CLEAN II CTO 0099	Annual Groundwater Monitoring	Annual groundwater monitoring conducted in December 2003 for RAA 11 and RAA 13.	*Annual Groundwater Sampling and Monitoring Report, Pearl Harbor Naval Complex, Oahu, Hawaii* (Earth Tech 2004a)
	Technical Memoranda	A Revised Technical Memorandum was prepared for RAA 11 and RAA 13 based upon the results of the annual monitoring. The Revised Technical Memorandum recommended one additional year of sampling at MW43 due to a high detection limit in the sample collected during the December 2003 monitoring event. For MW13, additional investigation activities were recommended to delineate the VOCs.	*Revised Technical Memorandum, Groundwater Monitoring Recommendations for Remedial Action Areas 11, 12, and 13, Pearl Harbor Naval Complex, Oahu, Hawaii* (Earth Tech 2004b)
		In response to the recommendations made in the Revised Technical Memorandum, an additional annual groundwater sampling event was conducted in June 2005. A second Revised Technical Memorandum was prepared for RAA 13 based on data from June 2005 sampling event. The second Revised Technical Memorandum recommended no additional monitoring at RAA 13 because VC concentrations (0.43 µg/L) had fallen below the EPA drinking water maximum contaminant level (MCL) of 2 µg/L and the DOH Tier I Action Level of 2 µg/L at MW43.	*Revised Technical Memorandum, Groundwater Monitoring Recommendations for Remedial Action Areas 12 and 13, Pearl Harbor Naval Complex, Oahu, Hawaii* (Earth Tech 2006)

CLEAN Program	Project	Scope of Work	Document
CLEAN III CTO HC01	Remedial Investigation	Based upon the recommendations of the 2004 Revised Technical Memorandum (Earth Tech 2004b), groundwater sampling was conducted at MW13 (RAA 11) and other nearby monitoring wells: MW90, SW22, and SW33, in an attempt to identify the source of VOCs in MW13. Groundwater samples collected from these wells in September 2007 did not detect any VOCs. Confirmation sampling of the same four wells in October 2007 also did not detect any VOCs. A RI was performed which summarized RAA 11 and RAA 13 groundwater sampling results through 2007, and evaluated potential risks to human health and ecological receptors. The risk evaluation concluded that RAA 11 and RAA 13 are safe for humans and environment.	*Remedial Investigation Report, Remedial Action Areas 11 and 13, Halawa-Main Gate GSA, Pearl Harbor, Hawaii* (AECOM 2011a)

2.2.2 1997 – 1998 Quarterly Groundwater Monitoring

In accordance with the NAVBASE Subsurface Fuel RI/FS recommendations (Ogden 1997), groundwater at MW13 (RAA 11) and MW43 (RAA 13) was sampled and analyzed on a quarterly basis from September 1997 to June 1998. The Revised Quarterly Groundwater and Product Monitoring Summary Report (September 1997–June 1998) for the Subsurface Fuel Investigation, Naval Base Pearl Harbor (Ogden 1998b) indicated that concentrations of VC as well as several other VOCs detected at RAAs 11 and 13 were below their respective project screening criteria (EPA Water Quality Criteria [EPA 1986] or Toxicological Benchmarks for Freshwater Biota [Suter II, et al 1996]), and a recommendation was made to discontinue quarterly groundwater monitoring at RAA 11 and RAA 13.

In a response to EPA Region 9 review comment no. 13 on the *Quarterly Groundwater and Product Monitoring Summary Report (September 1997–June 1998) for the Subsurface Fuel Investigation, Naval Base Pearl Harbor,* dated 18 February 1999, annual groundwater monitoring was initiated in June 1999 for a proposed duration of 2 years (Ogden 1999).

2.2.3 Annual Groundwater Monitoring

To address EPA concerns relating to VC detections in MW13 (RAA 11) and MW43 (RAA 13), annual groundwater monitoring was conducted from June 1999 to December 2003 at both RAA 11 and RAA 13.

The concentration of VC detected in RAA 11 during December 2003 was 0.43 µg/L, above the 2004 EPA Region 9 tap water preliminary remediation goal (PRG) of 0.02 µg/L for VC that was the screening criteria used at that time. As a result, additional investigation activities were recommended in the *Revised Technical Memorandum* (Earth Tech 2004b) to delineate the VOCs at RAA 11. These activities were also prompted by the findings in the *Site Summary Report*, *Halawa-Main Gate Geographic Study Area (GSA), Pearl Harbor Naval Complex, Oahu, Hawaii* (Earth Tech 2002) where Bldg. 550 was identified as a potential source of VOC contamination.

At RAA 13 in December 2003, VC was not detected during monitoring, but the laboratory reporting limit exceeded the VC tap water PRG (Earth Tech 2004a). Thus, VC may have been present above the PRG, but it would not have been detected. Concentrations of other VOCs were below PRGs. The *Revised Technical Groundwater Monitoring Recommendations for Remedial Action Areas 11, 12 and 13, Pearl Harbor Naval Complex, Hawaii* (Earth Tech 2004b) recommended an additional year of sampling due to this high laboratory reporting limit.

In 2005, the DOH developed environmental action levels (EALs) for groundwater at sites ≤150 meters to surface water bodies. This screening criterion was incorporated into the additional year of monitoring for RAA 13 in 2005. VC was detected at 1.6 µg/L in RAA 13 during this subsequent, additional year of monitoring. However, with no potential sources of VOCs identified and VC concentrations decreasing from an estimated value of 4 µg/L in February 2001 to 1.6 µg/L in 2005 (below the 2005 DOH EAL of 22 µg/L, and the EPA MCL screening criteria of 2 µg/L), no further monitoring was recommended in the *Revised Technical Memorandum, Groundwater Monitoring Recommendations for Remedial Action Areas 12 and 13, Pearl Harbor Naval Complex, Oahu, Hawaii* (Earth Tech 2006). The EPA and DOH supported this recommendation.

2.2.4 Remedial Investigation Report, Remedial Action Areas 11 and 13

In September 2007, Phase I groundwater samples were collected from MW13 (RAA 11) and other available existing monitoring wells to evaluate the concentration and lateral extent of previously

identified VOCs at RAA 11. Groundwater samples were collected from monitoring wells MW13, MW90, SW22, and SW33 and screened against the 2009 DOH EAL for VC of 21 µg/L (DOH 2009b) for non-drinking water sites located ≤150 meters to the nearest surface water. No VOCs were detected at concentrations above the method detection limits (0.23 µg/L). Confirmation sampling was conducted in October 2007; no VOCs were detected in these same wells at concentrations above the method detection limits.

The results of the Phase I RI and confirmation sampling also verify the decreasing trend of VC in RAA 11 to non-detect values as indicated from the historical sampling data trends as discussed in the *Remedial Investigation Report, Remedial Action Areas 11 and 13, Halawa-Main Gate GSA, Pearl Harbor, Hawaii* (AECOM 2011a). The last six sampling events conducted over a 7-year period (May 2000 through October 2007) show no detections of VC results exceeding the 2009 DOH EAL of 21 µg/L (DOH 2009b), with the last two events reporting VC as non-detect at 10 µg/L as shown in Table B-1.

Based on the recommendations made in the *Revised Technical Memorandum, Groundwater Monitoring Recommendations for Remedial Action Areas 12 and 13, Pearl Harbor Naval Complex, Oahu, Hawaii* (Earth Tech 2006), MW43 (RAA 13) was not sampled as part of the RI; however, risk associated with groundwater exposure at RAA 13 was evaluated and is further discussed in Section 2.7.1.

2.3 COMMUNITY PARTICIPATION

Public participation in the decision process for environmental activities at RAA 11 and RAA 13 has continually been encouraged throughout the environmental restoration and site closure processes. In an effort to involve the public in the decision-making process, a Restoration Advisory Board (RAB) was established. The RAB is composed of the DOH, Navy, and community representatives. The Navy has held RAB meetings (typically on a semiannual basis) and other public meetings, as well as issued fact sheets that summarize the site investigation and cleanup activities. Additionally, the Navy also established a point-of-contact at NAVFAC Hawaii for the public.

As described in Section 2.8, a proposed plan (PP) was prepared and a public meeting held to formally present the selected remedy to the public and to solicit public comment. Responses to verbal comments received during the comment period and public meeting are presented as a responsiveness summary in Attachment C within this ROD. No written comments were received during the public comment period. The complete transcript of the public meeting is available in the AR.

The transcript, PP, and other project documents, including work plans, technical reports, and other materials relating to the RAA 11 and RAA 13 sites can be found in the information repository at the following addresses:

Pearl City Library
1138 Waimano Home Road
Pearl City, Hawaii 96782
808-453-6566

Hamilton Library at the University of Hawaii at Manoa
Hawaiian and Pacific Collection
2550 McCarthy Mall
Honolulu, Hawaii 96822
808-956-8264

Additional project information is located in the AR file located at NAVFAC Pacific at JBPHH. The address for the AR is provided below:

Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
Attn: NAVFAC PAC EV4
JBPHH HI 96860-3134

2.4 SCOPE AND ROLE OF RESPONSE ACTION

RAAs 11 and 13 are located within the PHNC NPL site of JBPHH. The PHNC is listed on the NPL, which identifies priorities among known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories.

The Federal Facility Agreement (FFA) for PHNC (EPA, State of Hawaii, and DON 1994) documents how the Navy intends to meet and implement CERCLA in partnership with the EPA Region 9 and DOH. The general purposes of the FFA are to:

- Ensure that environmental impacts associated with past and present activities are thoroughly investigated and that appropriate remedial actions are taken, as necessary, to protect public health, welfare, and the environment.
- Establish a procedural framework and schedule for developing, implementing, and monitoring appropriate remedial actions in accordance with CERCLA, SARA, NCP, Superfund guidance and policy, Resource Conservation and Recovery Act guidance and policy, and applicable State of Hawaii law.
- Facilitate cooperation, exchange of information, and participation between the Navy, EPA, and the DOH.
- Ensure adequate assessment of potential injury to natural resources to ensure the implementation of remedial actions appropriate for achieving suitable cleanup levels.

The final remedy of No Action was chosen in accordance with CERCLA, as amended by SARA, and to the extent practicable the NCP. Information supporting the decisions leading to the selected remedy is contained in the AR file for the site.

RAAs 11 and 13 were initially identified as 2 of 13 areas recommended for further evaluation during the larger Subsurface Fuel RI/FS, when chlorinated VOC concentrations were detected in the groundwater associated with MW13 (RAA 11) and MW43 (RAA 13). Except for RAA 12 located adjacent to Magazine Loch, all other remaining RAAs are associated with fuel and petroleum products. These ten RAAs were addressed together during the Subsurface Fuel Environmental Health Evaluation/Environmental Health Management Plan (EHE/EHMP) (AECOM 2010) under the State of Hawaii State Contingency Plan. Additional investigative work is presently underway at RAA 12 to delineate the lateral extent of chlorinated VOCs within the deeper unconfined aquifer.

RAAs 11 and 13 are geographically separated from one another, and each is situated, and surrounded, by the larger Subsurface Fuel plume. Subsequent sampling at both RAAs 11 and 13 has confirmed that the extents of RAAs 11 and 13 are limited to groundwater at MW13 and MW43, respectfully, and risk evaluations have concluded the neither site poses an unacceptable risk to either human health or the environment. As a result, the proposed No Action decision at RAA 11 and RAA 13 should have little to no bearing on the overall site remediation of the Halawa-Main Gate GSA or

the PHNC NPL Site as a whole and will be abandoned in accordance with NAVFAC Pacific Environmental Restoration Program Procedure I-C-1, *Monitoring Well Installation and Abandonment* (DON 2007).

2.5 SITE CHARACTERISTICS

This section describes site characteristics that could affect the nature and extent as well as the fate and transport of chemicals potentially released at the RAA 11 and RAA 13 sites.

2.5.1 Physical Setting and Site Features

RAAs 11 and 13 are situated in the Halawa-Main Gate GSA within the JBPHH located on the south-central portion of the island of Oahu, Hawaii (Figure 1).

RAA 11 is MW13 and is located in the northeastern portion of the Halawa-Main Gate GSA (Figure 2). It is located south of Bldg. 550 and adjacent to the tennis courts. RAA 13 is MW43 and is located in the east-central portion of the Halawa-Main Gate GSA, near Edge Street between North Road and Kamehameha Highway, immediately fronting Bldg. 1330 and just south of the Upper Tank Farm (Figure 3).

2.5.2 Geology

Pearl Harbor is located within Oahu's coastal plain geomorphic province, and is underlain by a thick sequence of sedimentary strata known as caprock, which includes interbedded coral-reef limestone, volcanic tuff, and alluvium. The caprock strata overlie basalts extruded as lava flows during the primary mountain building phase of volcanism on Oahu. Near Pearl Harbor, the caprock strata form a shelf roughly 6 miles wide at its widest point and up to 1,000 feet thick at the entrance to the main navigation channel (Stearns and Vaksvik 1938).

The caprock formation along the east shore of Pearl Harbor consists of volcanic tuff deposits of the Honolulu Volcanic Series formed by the rapid welding of hot volcanic ash interbedded with nearshore and shallow marine coralline limestones deposited during periods of sea level transgression and regression. These nearshore deposits were in turn cut by streams, and the cuts were filled with stream-transported colluvium and alluvium (Wentworth 1951). This complex sequence of marine/alluvial/volcanic deposits collectively form the roughly wedge-shaped caprock formation that overlies the basalt basement rock and mantles most of the seaward margins of southern Oahu (Wentworth 1951; MacDonald et al. 1983).

As the JBPHH was developed, the East Pearl Harbor landscape was drastically altered by grading and dredging, and the shoreline was modified and extended through the use of fill. The results of previous investigations on the east side of Pearl Harbor (Munro 1981) indicate that the modern general geologic sequence from ground surface down through the caprock is as follows:

- Fill materials
- Makalapa and Salt Lake tuff
- Alluvium and coralline sediments
- Alluvial and coralline limestone sediments, with localized lagoonal deposits

Wells and soil borings advanced at the investigation area for RAAs 11 and 13 revealed a similar stratigraphic sequence.

Local geology beneath the RAA 11 site is dominated by the evolution of Halawa Stream. Historically, as Halawa Stream flowed into Pearl Harbor, it eroded the volcanics and deposited alluvium and later lagoonal estuarine sediments in the form of levee deposits in the area of RAA 11. Evidence of the alluvium and lagoonal deposits is observed in the boreholes associated with monitoring wells MW13, MW20, MW90, MW94, and SW22, with thicknesses varying between 5 and 32 feet below ground surface (bgs). At the top of these deposits, from approximately ground surface to 5 feet bgs, a variety of fill material was placed during development in areas adjacent to Bldg. 550.

The subsurface geology of RAA 13 consists of marine, alluvial, volcanic, and man-made backfill deposits. The materials observed in the boring for well MW07 comprise marine coralline sand at the base, which is overlain by approximately 10 feet of alluvial silts and clay, which is in-turn overlain by approximately 30 feet of volcanic tuff. Approximately 16 feet of volcanic tuff are present at RAA 13, which is underlain by approximately 10 feet of clayey silts and silty clays. Fill of various thicknesses (0 to 2 feet) is present at the surface across RAA 13.

2.5.3 Hydrogeology and Hydrology

Groundwater conditions at the Halawa-Main Gate GSA are typical of the area surrounding Pearl Harbor, with unconfined caprock groundwater in shallow sediments that overlie and confine the basal aquifer within the fractured basalt bedrock. Although the caprock groundwater generally exists under unconfined conditions, groundwater elevation fluctuations suggest that the caprock may be confined in some areas of the Halawa-Main Gate GSA. However, the elevation fluctuations may be caused by seasonal rains and/or tides, and the available data are insufficient to make a definite assessment (Ogden 1994).

In contrast to the fractured Koolau basalts, which have hydraulic conductivity (K) values up to a few thousand feet per day (ft/day), tuff deposits generally have much lower K values, ranging from about 1 ft/day (3.5×10^{-4} centimeters per second [cm/sec]) to 100 ft/day (3.5×10^{-2} cm/sec) (Takasaki and Mink 1982).

The caprock aquifer is recharged by rainfall and irrigation water, and is tidally-influenced as it is in direct hydraulic connection with Pearl Harbor. Total dissolved solids (TDS) concentrations fall within the saline range (defined as 10,000 to 100,000 milligrams per liter [mg/L]; Freeze and Cherry 1979), well above the 10,000-mg/L limit for drinking water under the EPA guidelines. In November 2006, NAVFAC Pacific issued a report, *Final Classification of Shallow Caprock Groundwater at Navy Oahu Facilities, Oahu, Hawaii* (Earth Tech 2007) to document the results of a groundwater utility evaluation for Navy installations and facilities on Oahu. Although the data from this report suggest that caprock groundwater may meet the criteria for classification as a Class II groundwater body under the EPA Groundwater Protection Strategy (EPA 1988) for the Halawa-Main Gate GSA (i.e., aquifer represents a current or potential source of drinking water), evaluation against federal, state, and site-specific criteria indicates that caprock groundwater does not represent a current or potential future drinking water source (Earth Tech 2007).

At RAA 11, the groundwater gradient ranges from 0.002 to 0.005 foot per foot (ft/ft) (Ogden 1997) with flow to the northwest, towards the mouth of Halawa Stream. Depths to groundwater at monitoring well MW13 were measured in September 2007 at 10.41 feet bgs with minor tidal fluctuations. Nearby surface water features are Pearl Harbor and Halawa Stream, approximately 1,000 feet to the north-northwest.

At RAA 13, the groundwater gradient is 0.0005 ft/ft (Ogden 1997) with flow to the west, towards Magazine and Quarry Loch in Pearl Harbor. Depths to groundwater at monitoring well MW43 were measured in December 2003 at 22.14 bgs feet with minor tidal fluctuations. Pearl Harbor is the nearest surface water feature located approximately 1,200 to 2,000 feet to the west.

Pearl Harbor is the primary surface water body near RAAs 11 and 13. The harbor is an estuarine environment, bordered by wetland and marsh habitats. Halawa Stream is located approximately 1,000 feet to the north of RAA 11. Pearl Harbor is the nearest surface water feature to RAA 13 and is located approximately 1,200 to 2,000 feet to the west. There are no surface water features in RAAs 11 or 13, as surface water runoff throughout JBPHH is collected in the storm drain systems, and discharges to Pearl Harbor from outfalls located along the piers. Surface water drainage generally runs from east to west. The State of Hawaii classifies Pearl Harbor as a Class 2 inland estuary. Industrial, agricultural, recreational, and fishery activities are permitted in Class 2 waters, but new industrial discharges are restricted (DOH 2009a).

Pearl Harbor receives fresh water from perennial and intermittent streams, artesian springs, and the shallow caprock aquifer. Within JBPHH, West Loch, Middle Loch, and East Loch represent drowned riverbeds that formed a single ancient river when the sea level rose. This river flowed into the Pacific Ocean south of the Schofield Plateau, flooding the valley to form the entrance channel to the harbor.

2.6 CURRENT AND POTENTIAL FUTURE LAND AND WATER USES

According to estimates from the Hawaii Department of Business, Economic Development, and Tourism and the U.S. Census Bureau, the 2010 estimated resident population for the City and County of Honolulu is 953,207 persons. Approximately 4,000 people reside in the PHNC, which contains about 800 households.

Both RAA 11 and RAA 13 are located within the Halawa-Main Gate GSA. The main industrial areas for this GSA include FISC, SUBASE, and NAVSTA. The FISC occupies over 800 acres of mainly administrative and warehouse buildings in the RAA 11 area. NAVSTA controls the waters of Pearl Harbor and approximately 840 acres of land (Ogden 1994). The NAVSTA core areas include maintenance, administrative, supply, and training buildings, BEQ, and personnel support facilities. The present land use is a mix of industrial facilities and office complexes of the PHNC. According to the *Commander, Navy Region Hawaii Regional Integration Plan* (DoD 2012) and the *Joint Base Pearl Harbor-Hickam Northside Area Development Plan Training Practicum* (DON 2012), no changes in land use are anticipated in the future.

In November 2006, NAVFAC Pacific issued a report, *Final Classification of Shallow Caprock Groundwater at Navy Oahu Facilities, Oahu, Hawaii* (Earth Tech 2007) to document the results of a groundwater utility evaluation for Navy installations and facilities on Oahu. Although the data from this report suggest that shallow, caprock groundwater may meet the criteria for classification as a Class II groundwater body under the EPA Groundwater Protection Strategy (EPA 1988) for the Halawa-Main Gate GSA, evaluation against federal, state, and site-specific criteria indicates that caprock groundwater does not represent a current or potential future drinking water source (Earth Tech2007a). This is due in large part because the caprock aquifer is in direct hydraulic connection with Pearl Harbor and is tidally influenced, resulting in TDS concentrations in the saline range (defined as 10,000 to 100,000 mg/L; Freeze and Cherry 1979), well above the 10,000-mg/L limit for drinking water under the EPA guidelines. As a result of this classification, the DOH EALs for non-drinking water sites ≤150 meters to a surface water body are considered the most appropriate screening criteria for groundwater at Halawa-Main Gate GSA sites.

There is no significant terrestrial habitat of any consequence at the RAA 11 and RAA 13 sites considering the developed fuel storage, warehouse facilities, and urban/industrial setting (Ogden 1994). Non-native species form the majority of the terrestrial wildlife associated with urbanized areas, grasslands, and disturbed secondary forest communities in the Pearl Harbor area.

2.6.1 Conceptual Site Model

Tier IA human health screening risk assessments (SRAs) are intended to address only contaminants for which there is a complete or potentially complete exposure pathway under current and future land use conditions (EPA 1989). The Tier IA SRAs for RAAs 11 and 13 utilized EPA regional screening levels (RSLs) (EPA 2010) for the residential exposure scenarios as a means to identify chemicals of potential concern (COPCs). While redevelopment in the vicinity of either MW13 (RAA 11) or MW43 (RAA 13) into residential land use is not anticipated (*Commander, Navy Region Hawaii Regional Integration Plan* (DoD 2012) and *Joint Base Pearl Harbor-Hickam Northside Area Development Plan Training Practicum* (DON 2012), comparison to residential RSLs was conducted as a conservative measure. Complete and potentially complete exposure pathways are identified as part of a conceptual site model (Figure 4). The depth to groundwater is approximately 22 feet bgs, and groundwater is not a source of drinking water, as a result, no direct human health exposure pathway to groundwater exists.

As part of the Tier I SRA, the seven VOCs detected in groundwater collected from MW43 (1,2-dichloroethene, sec-butylbenzene, benzene, isopropyl benzene, toluene, trichloroethene, and VC) were compared to screening criteria for groundwater migrating to indoor air. None of the seven VOCs exceed either of their respective criterion.

There are no vegetated areas near RAAs 11 or 13; each area is paved. The sites are also not conducive to wildlife foraging or breeding due to the high level of urbanization in the area. No wetlands, sensitive plants, or wildlife are present at these sites. There is no direct exposure for plants or animals to the groundwater at either RAA 11 or RAA 13. Ecological exposure to groundwater could occur as it flows into nearby Pearl Harbor.

2.7 SUMMARY OF SITE RISKS

2.7.1 Human Health Risk Assessment Summary

The RI was completed in 2011 and evaluated historical and current concentrations and potential sources of VOCs (mainly VC) at MW13 (RAA 11) and MW43 (RAA 13). The RI considered historical sampling events at both RAA 11 and RAA 13, as well as a groundwater sampling event and associated confirmation sampling event at RAA 11 and vicinity wells (MW90, SW22, and SW33) in 2007 in the human and ecological screening risk assessment.

Soil analytical data for RAAs 11 and 13 are limited to soil sampling results obtained from the Subsurface Fuel RI/FS (1994-1997). Soil samples were collected at both RAAs 11 and 13 as well as nearby locations during the drilling of temporary groundwater sampling points and during the drilling and installation of more permanent monitoring wells. No detections of chlorinated VOCs were reported in any of the soil samples (Ogden 1994, 1997).

Groundwater data collected from monitoring wells near RAA 11 (MW20, MW90, MW94, SW22, and SW33 [Figure 2]) in December 1995 for the 1997 NAVBASE Subsurface Fuel RI/FS were evaluated for the presence of the VOCs. None of the wells near RAA 11 had detections of VOCs as documented in the *Revised Technical Groundwater Monitoring Recommendations for Remedial Action Areas 11, 12 and 13, Pearl Harbor Naval Complex, Hawaii* (Earth Tech 2004b). Reported

concentrations of VOCs (primarily VC) in the samples from RAA 11 exceeded the 2002 tap water PRG in 9 of the 10 monitoring events, and exceeded the DOH Tier 1 Action Level in 7 of the 10 monitoring events. Based on reported concentrations shown in Attachment B, Table B-1, the concentration of VC is decreasing over time. Because the VC concentrations have been decreasing with the most recent level, from 2007, below the DOH Tier 1 Action Level, and because of the lack of potential receptors in the vicinity, it is unlikely that exposure to groundwater from RAA 11, should it occur, would result in adverse effects to human health. As seen in Tables B-1 and B-2, the reporting limits for the various VOCs during the early rounds of groundwater sampling were relatively high (10 µg/L) compared to the later sampling rounds. By the final rounds of sampling, the reporting limits were adequate for comparison with the current screening levels.

Groundwater data collected from the monitoring wells near RAA 13 (MW7, MW37, MW44, MW45, and MW100 [Figure 3]) in December 1995 for the 1997 NAVBASE Subsurface Fuel RI/FS were evaluated for the presence of the VOCs. None of the wells near RAA 13 had detections of VOCs as documented in the *Revised Technical Memorandum, Groundwater Monitoring Recommendations for Remedial Action Areas 12 and 13, Pearl Harbor Naval Complex, Oahu, Hawaii* (Earth Tech 2006). No potential sources of VOCs have been identified at the site. With no sources identified and the concentrations of VC decreasing from 4 µg/L in February 2001 to 1.6 µg/L in 2005 (which is below the DOH Tier 1 Action Level), it is unlikely that exposure to groundwater from RAA 13, should it occur, would result in adverse effects to human health (Attachment B, Table B-2). Evaluation of the vapor intrusion potential of VOCs into indoor air further indicates that VOCs detected in groundwater from RAA 13 would not have an adverse effect on human health.

Based on the results of the risk-based screening, no COPCs were identified for RAA 11 and RAA 13. Thus, the Tier IB risk evaluation was not conducted. It is unlikely that exposure to groundwater from either RAA 11 or RAA 13, should it occur, would result in adverse effects to human health.

As part of the Tier I SRA, the seven VOCs detected in groundwater collected from RAA 13 (1,2-dichloroethene, sec-butylbenzene, benzene, isopropyl benzene, toluene, trichloroethene, and VC) were compared to screening criteria for groundwater migrating to indoor air. The criteria selected for comparison were from the DOH EAL Table C-1a, Groundwater Action Levels for Evaluation of Potential Vapor Intrusion Hazards (DOH 2011), which is based on unrestricted use and EPA's Table 2c, Generic Screening Levels and Summary Sheet (EPA 2002). None of the seven VOCs exceed either of their respective criterion, as noted in Table 2-2 below.

As shown in Attachment B, Table B-2, all of the chemicals detected in earlier rounds of groundwater sampling from RAA 11 were not detected at concentrations greater than analytical method reporting limits in the last two sampling rounds in 2007. In addition, the reporting limits are well below the DOH EALs. As a result, only RAA 13 groundwater data was compared to Indoor Air Screening Criteria.

Table 2-2: Comparison of VOC Groundwater Concentrations in RAA 13 to Indoor Air Screening Criteria

Detected Groundwater VOCs [a]	DOH VI EAL (µg/L) [b]	EPA Target Groundwater Concentration Corresponding to Target Indoor Air Concentration (µg/L) [c]	Most Recent Groundwater Concentration (µg/L) [a]	Groundwater Concentration Exceeds Either Screening Criteria?
1,2-Dichloroethene [d]	1,100	180	3.3	No
sec-Butylbenzene	n/a	250	0.45	No
Benzene	1,900	5 [e]	0.4	No
Isopropylbenzene	n/a	n/a	0.75	No

Detected Groundwater VOCs [a]	DOH VI EAL (µg/L) [b]	EPA Target Groundwater Concentration Corresponding to Target Indoor Air Concentration (µg/L) [c]	Most Recent Groundwater Concentration (µg/L) [a]	Groundwater Concentration Exceeds Either Screening Criteria?
Toluene	530,000	1,500	0.27	No
Trichloroethylene	610	5 [e]	0.22	No
VC	62	2.5	1.6	No

n/a not available
VI vapor intrusion
[a] COPCs evaluated for vapor intrusion were those detected in MW43, which was last sampled in June 2005.
[b] Source: Table C-1a, Groundwater Action Levels for Evaluation of Potential Vapor Intrusion Hazards (DOH 2011); based on unrestricted use at a target risk = 1×10^{-6}.
[c] EPA's target groundwater concentration corresponding to target indoor air concentration where the soil gas to indoor air attenuation factor = 0.001 and partitioning across the water table obeys Henry's Law. Source: Table 2c, Generic Screening Levels and Summary Sheet (Risk = 1×10^{-6}) in Guidance for Evaluating Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (EPA 2002).
[d] Screening criteria are either for cis- or trans-dichloroethene, whichever is lowest.
[e] Target groundwater concentration is EPA's maximum contaminant level for drinking water.

2.7.2 Ecological Risk Assessment Summary

No ecological risk assessment was conducted as part of the 2011 RI at RAA 11 and RAA 13. There are no vegetated areas near RAAs 11 or 13; each area is paved. The sites are also not conducive to wildlife foraging or breeding due to the high level of urbanization in the area. No wetlands, sensitive plants, or wildlife are present at these sites. Ecological exposure to groundwater could occur as it flows into nearby Pearl Harbor. However, most of the 2009 DOH EALs are based on aquatic habitat goals (DOH 2009b) and none of the EALs were exceeded in the latest rounds of groundwater sampling (RAA 11 in 2007, RAA 13 in 2005) including VC for which the DOH EAL aquatic habitat goal is 780 µg/L. Thus, it is unlikely that exposure to groundwater from either RAA 11 or RAA 13 would result in adverse effects to animals or plants.

2.8 DOCUMENTATION OF SIGNIFICANT CHANGES

The PP (DON 2011) identified No Action as the final remedy selected for RAA 11 and RAA 13. The PP was released for public comment on 17 October 2011, and a public meeting to present and discuss the PP was held on 1 November 2011. The public comment period for the PP was held between 17 October 2011 and 17 November 2011. The Navy received no comments on the PP from the public that would affect the selected remedy; therefore, no significant changes have occurred.

Contributing Sources	Transport Mechanisms	Exposure Route	Receptors: Current Land Use – Onsite Workers	Current Land Use – Trespassers (Adult/Child)	Future Land Use – Hypothetical Residents (Adult/Child)	Future Land Use – Onsite Workers	Future Land Use – Trespassers (Adult/Child)	Future Land Use – Construction/ Utilities Workers	Rationale
Surface Soil- Possibly Bldg. 550 (RAA 11) and Tank No. 45 (RAA 13)	Direct Contact	Dermal Absorption	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Dermal absorption and incidental ingestion of surface soil are incomplete pathways for all receptors. Previous Subsurface Fuel Remedial Investigations concluded that groundwater was the only medium of concern at RAA 11 and RAA 13 (Ogden 1994, 1997).
		Incidental Ingestion	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Same as above for human receptors.
	Air Transport	Inhalation of VOCs	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	The inhalation pathway for VOCs is considered incomplete for human receptors because VOCs in surface soil volatilize to the atmosphere quickly, especially in a warm climate.
		Inhalation of Particulates	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Inhalation of contaminated dust is an incomplete pathway for all human receptors. Previous Subsurface Fuel Remedial Investigations concluded that groundwater was the only medium of concern at RAA 11 and RAA 13 (Ogden 1994, 1997).
	Bio-uptake	Ingestion of Plants/Animals	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	There are no agricultural activities on site.
	Surface Water/ Sediment	Dermal Absorption	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	The surface water bodies at Pearl Harbor are greater than 150 feet from RAAs 11 and 13, thus it is unlikely that chemicals from either site would migrate to any surface water. This pathway is incomplete for all receptors.
		Incidental Ingestion							
		Inhalation of VOCs							
		Bioaccumulation/ Consumption of Food							
Subsurface Soil/	Unsaturated/ Saturated Zone Transport to Groundwater	Dermal Absorption	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Direct contact with groundwater is considered an incomplete exposure pathway for all receptors because it occurs at or below 22 feet bgs. Groundwater on site is in contact with Pearl Harbor, resulting in unacceptably high total dissolved solids concentrations. Thus, it is not a source of drinking water and is not potable. VOCs were detected in groundwater samples collected from MW13 (RAA 11) and MW43 (RAA 13). A slight potential exists for accumulation of VOCs inside buildings on site.
		Incidental Ingestion and as Drinking Water							
		Inhalation of VOCs as Indoor Air	Potentially Complete	Incomplete	Potentially Complete	Potentially Complete	Incomplete	Incomplete	
	Direct Contact	Dermal Absorption	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Direct contact with subsurface soil is incomplete for all current and future human receptors. Previous Subsurface Fuel Remedial Investigations concluded that groundwater was the only medium of concern at RAA 11 and RAA 13 (Ogden 1994, 1997).
		Incidental Ingestion							
		Inhalations of VOCs							
		Inhalation of Particulates	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	

Figure 4
Conceptual Site Model
Record of Decision
Remedial Action Areas 11 and 13
PHNC NPL Site
JBPHH, Oahu, Hawaii

3. Responsiveness Summary

A public notice announcing availability for review of the PP was placed in the *Honolulu Star-Advertiser* on 16 October 2011. The public comment period for the PP was held between 17 October and 17 November 2011. The public meeting for the PP was held on 1 November 2011 at the Leeward Community College. This Responsiveness Summary provides a summary of the public comments received during the public meeting.

Members of the community present at the public meeting expressed verbal comments on the PP. Responses to the written and verbal comments received during the comment period and public meeting are presented as a Responsiveness Summary in Attachment C within this ROD. The complete transcript of the public meeting is available in the AR.

3.1 Stakeholder Issues and Lead Agency Responses

A written transcript of the public meeting conducted on 1 November 2011 was thoroughly reviewed by the Navy to prepare the Responsiveness Summary. The comments and questions from the public have been condensed to provide a better understanding of each specific issue. The Navy and EPA Region 9, with approval from Headquarters EPA, and with concurrence from the DOH, have selected the final remedy for the RAA 11 and RAA 13 sites only after careful consideration of the public's comments on the PP.

3.2 Technical and Legal Issues

No technical or legal issues have been identified for the selected final remedy of No Action for the RAA 11 and RAA 13 sites.

4. References

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Attachment A
Detailed Reference Table

Table A-1: Detailed Reference Table

Item	Reference Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record
1	The NAVBASE Subsurface Fuel RI/FS Report recommended	Section 2.2.1, second paragraph, Page 2-2	*Remedial Investigation/ Feasibility Study for Subsurface Fuel Investigation, Naval Base, Pearl Harbor, Hawaii (Phase I*) (Ogden 1994) Section 7, Page 7-1
2	annual groundwater monitoring was initiated in June 1999	Section 2.2.2, second paragraph, Page 2-9	*Quarterly Groundwater and Product Monitoring Summary Report (September 1997–June 1998) for the Subsurface Fuel Investigation, Naval Base Pearl Harbor* (Ogden 1998) Executive Summary
3	additional investigation activities were recommended	Section 2.2.3, second paragraph, Page 2-9	*Revised Technical Groundwater Monitoring Recommendations for Remedial Action Areas 11, 12 and 13, Pearl Harbor Naval Complex, Hawaii* (Earth Tech 2004b) Section 5.4, Page 10
4	recommended an additional year	Section 2.2.3, third paragraph, Page 2-9	*Revised Technical Groundwater Monitoring Recommendations for Remedial Action Areas 11, 12 and 13, Pearl Harbor Naval Complex, Hawaii* (Earth Tech 2004b) Section 5.4, Page 10
5	no further monitoring was recommended	Section 2.2.3, fourth paragraph, Page 2-9	*Revised Technical Memorandum, Groundwater Monitoring Recommendations for Remedial Action Areas 12 and 13, Pearl Harbor Naval Complex, Oahu, Hawaii* (Earth Tech 2006) Section 4.4, Page 7
6	caprock groundwater does not represent	Section 2.5.3, third paragraph, Page 2-13	*Final Classification of Shallow Caprock Groundwater at Navy Oahu Facilities, Oahu, Hawaii* (Earth Tech 2007) Section 4, Page 4-1
7	it is unlikely that exposure to groundwater from RAA 11	Section 2.7.1, third paragraph, Page 2-16	*Remedial Investigation Report, Remedial Action Areas 11 and 13, Halawa-Main Gate GSA, Pearl Harbor, Hawaii* (AECOM 2011a) Section 6.4.3, Page 6-9
8	it is unlikely that exposure to groundwater from RAA 13	Section 2.7.1, fourth paragraph, Page 2-16	*Remedial Investigation Report, Remedial Action Areas 11 and 13, Halawa-Main Gate GSA, Pearl Harbor, Hawaii* (AECOM 2011a) Section 6.4.3, Page 6-9
9	public meeting for the PP	Section 3, first paragraph, Page 3-1	*Proposed Plan, Remedial Action Area 11 and Remedial Action Area 13, Halawa-Main Gate GSA, Joint Base Pearl Harbor-Hickam, Oahu, Hawaii* (AECOM 2011b)

Attachment B
Historical Groundwater and Soil Data

Table B-1: Comparison of Screening Criteria to VOC Concentrations in Groundwater Monitoring Well MW13 (RAA 11)

	VOC Concentrations (µg/L)												Current (µg/L)			Historical Screening Criteria (µg/L)			
Analyte	Dec-95	Sep-97	Dec-97	Mar-98	Jun-98	Jun-99	May-00	Feb-01	Jun-02	Dec-03	Sep-07	Oct-07	2010 RSL	MCL	2009 DOH EAL	2004 PRG	DOH EAL	MCL	2002 PRG
1,1-Dichloroethane	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	2.4	NS	47	810	47	NS	810
1,1-Dichloroethene	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	<1 U	< 0.30 U	< 0.30 U	340	7	25	340	25	7	340
1,1,1-Trichloroethane	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	9,100	200	62	3,200	62	200	3,200
1,1,2,2-Tetrachloroethane	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.10 U	< 0.10 U	0.067	NS	162	0.055	150	NS	0.055
1,2-Dichloroethene total	< 10 U	**2 J**	**2 J**	**2 J**	**4 J**	**2 J**	< 10 U	**2 J**	< 10 U	< 1 U	<0.19/0.07U	<0.19/0.07U	330	NS	590	120 [a] , 61 [b]	590	100 [a] , 70 [b]	120 [a] , 61 [b]
1,2-Dichloroethane	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	0.15	5	125	0.12	130	5	0.12
1,2-Dichloropropane	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	0.39	5	100	0.16	100	5	0.16
1,1,2-Trichloroethane	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.20 U	< 0.20 U	0.24	5	300	0.2	280	5	0.2
2-Hexanone	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 U	NA	NA	47	NS	NS	NS	NS	NS	NS
4-Methyl-2-pentanone	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 U	NA	NA	2,000	NS	170	NS	170	NS	NS
Bromoform	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	8.5	80	3,200	8.5	3,200	NS	8.5
sec-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 U	NA	NA	NS	NS	NS	240	NS	NS	240
2-Butanone	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 U	NA	NA	7,100	NS	14,000	NS	NS	NS	NS
Acetone	< 10 UJ	< 10 UJ	< 10 U	< 10 UJ	< 10 UJ	< 10 UJ	< 10 U	< 10 UJ	< 10 U	< 10 U	< 0.9 U	< 0.9 U	22,000	NS	1,500	5,500	1,500	NS	610
Benzene	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.4 U	NA	NA	0.41	5	46	0.35	46	5	0.34
Bromodichloromethane	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.5 U	< 0.14 U	< 0.14 U	0.12	80	162	0.18	270	NS	0.18
Bromomethane	< 10 U	< 10 UJ	< 10 U	< 10 UJ	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 U	< 3 U	NA	NA	8.7	NS	160	8.7	160	NS	8.7
Carbon Disulfide	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 2 U	NA	NA	1,000	NS	NS	1,000	NS	NS	1,000
Carbon Tetrachloride	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.10 U	< 0.10 U	0.44	5	9.8	0.17	9.8	5	0.17
cis-1,3-Dichloropropene	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.4 U	NA	NA	0.43	NS	122	0.4	120	NS	0.4
Chlorobenzene	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.5 U	< 0.21 U	< 0.21 U	91	100	25	110	25	100	110
Chloroethane	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	21,000	NS	160	4.6	3.9	NS	4.6
Chloromethane	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	190	NS	294	1.5	3,200	NS	1.5
Chloroform	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.07 U	< 0.07 U	0.19	80	74	0.17	62	NS	6.2
Dibromochloromethane	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.5 U	NA	NA	0.15	80	267	0.13	160	NS	0.13
Ethylbenzene	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	1.5	700	290	2.9	290	700	2.9
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 U	NA	NA	680	NS	NS	660	NS	NS	NS
Methylene Chloride	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 5 U	< 0.35 U	< 0.35 U	4.8	5	2,200	4.3	2,200	NS	4.3
Styrene	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	1,600	100	100	1,600	100	100	1,600
Tetrachloroethene	< 10 U	< 10 UJ	< 10 U	< 10 U	5 J	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.4 U	< 0.15 U	< 0.15 U	0.11	5	120	0.1	99	5	0.66
Toluene	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	2,300	1,000	130	720	130	1,000	720
trans-1,3-Dichloropropene	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.4 U	NA	NA	0.43	NS	122	0.4	120	NS	0.4
Trichloroethene	< 10 U	< 10 UJ	**2 J**	< 10 U	**57 J**	< 10 UJ	< 10 U	**1 J**	< 10 U	< 1 U	< 0.16 U	< 0.16 U	2	5	360	0.0282	74	5	0.0282
Trichlorofluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 U	< 0.24 U	< 0.24 U	1,300	NS	NS	1,300	NS	NS	1,300
Vinyl Chloride	**93 J**	**16 J**	**29 J**	**29 J**	**50 J**	**24 J**	**1 J**	**9 J**	< 10 U	0.43 J	< 0.23 U	< 0.23 U	0.016	2	21	0.02	22	2	0.02
Xylene total	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	NA	NA	200	10,000	100	210	100	10,000	210
Sample EPA ID Numbers [c]	HB584	HC003	HC013 & HC014	HC017	HC025 & HC026	HC032 & HC033	HC037	HC048 & HC049	HC054	TV001	EM007	EM017 & EM018	—	—	—	—	—	—	—

Data source: *Remedial Investigation Report, Remedial Action Areas 11 and 13, Halawa-Main Gate GSA, Pearl Harbor, Hawaii* (AECOM 2011).

Bold = analyte detected during laboratory analysis

µg/L = microgram per liter

DOH = Department of Health, State of Hawaii

EAL = Environmental Action Level

EPA = Environmental Protection Agency, United States

MCL = maximum contamination limit under the Safe Drinking Water Act (40 CFR Part 141)

NA = Not analyzed

PRG = Preliminary Remediation Goal

QL = quantitation limit

2010 RSL = November 2010 Regional Screening Level

VOC = volatile organic compound

U = The analyte was analyzed for, but was not detected above the reported sample QL.

J = The analyte was positively identified; the associated numerical value is the approximate concentration.

NJ = The presence of the analyte has been "tentatively identified" and the associated numerical value is an approximate concentration.

UJ = The analyte was not detected, however, the reported QL is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

2004 PRG - Environmental Protection Agency (EPA) Region 9 Preliminary Remediation Goals Tap Water 2004

DOH EAL - DOH Tier I EAL (groundwater is not a source of potential drinking water; surface water ≤ 150 m) DOH 2005

2002 PRG - EPA Region 9 Preliminary Remediation Goals Tap Water 2002

DOH Tier I - DOH Tier 1 Action Levels for groundwater (rainfall ≤ 200 cm per year) DOH Risk-based Corrective Action (RBCA) DOH 1996

DOH EAL 2009 - DOH Tier I EALs Table D-1c: groundwater is not a source of potential drinking water; surface water ≤150 m DOH 2009

[a] = trans-1,2-Dichloroethene

[b] = cis-1,2,-Dichloroethene

[c] = Results of samples with two EPA ID numbers are reported using the higher concentration of the two samples.

Table B-2: Comparison of Screening Criteria to VOC Concentrations in Groundwater Monitoring Well MW43 (RAA 13)

	VOC Concentrations (µg/L)											Current (µg/L)			Historical Screening Criteria (µg/L)			
Analyte	Dec-95	Sep-97	Dec-97	Mar-98	Jun-98	Jun-99	May-00	Feb-01	Jun-02	Dec-03	Jun-05	2010 RSL	MCL	2009 DOH EAL	2004 PRG	DOH EAL	MCL	2002 PRG
1,1-Dichloroethane	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.13 U	2.4	NS	47	810	47	NS	810
1,1-Dichloroethene	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.14 U	340	7	25	340	25	7	340
1,1,1-Trichloroethane	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.16 U	9,100	200	62	3,200	62	200	3,200
1,1,2,2-Tetrachloroethane	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.23 U	0.067	NS	162	0.055	150	NS	0.055
1,2-Dichloroethene total	< 10 U	**1 J**	**1 J**	**1 J**	**1 J**	**2 J**	**2 J**	**2 J**	< 10 U	**3.21** [a]	**3.3**	330	NS	590	120 [a] , 61 [b]	590	100 [a] , 70 [b]	120 [a] , 61 [b]
1,2-Dichloroethane	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.25 U	0.15	5	125	0.12	130	5	0.12
1,2-Dichloropropane	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.16 U	0.39	5	100	0.16	100	5	0.16
1,1,2-Trichloroethane	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.15 U	0.24	5	300	0.2	280	5	0.2
2-Hexanone	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 U	< 18 R	47	NS	NS	NS	NS	NS	NS
4-Methyl-2-pentanone	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 U	< 2 U	2,000	NS	170	NS	170	NS	NS
Bromoform	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.33 U	8.5	80	3,200	8.5	3,200	NS	8.5
sec-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.48 J**	**0.45**	NS	NS	NS	240	NS	NS	240
2-Butanone	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 10 U	< 2.0 U	7,100	NS	14,000	NS	NS	NS	NS
Acetone	< 10 UJ	< 10 UJ	< 10 U	10 UJ	< 10 UJ	< 10 UJ	< 10 U	< 10 UJ	< 10 U	< 10 U	**6.6 J**	22,000	NS	1,500	5,500	1,500	NS	610
Benzene	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	**0.47**	**0.4**	0.41	5	46	0.35	46	5	0.34
Bromodichloromethane	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.5 U	< 0.12 U	0.12	80	162	0.18	270	NS	0.18
Bromomethane	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 U	< 3 U	< 0.21 U	8.7	NS	160	8.7	160	NS	8.7
Carbon Disulfide	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	<10 U	< 10 U	< 2 U	< 0.38 U	1,000	NS	NS	1,000	NS	NS	1,000
Carbon Tetrachloride	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.15 U	0.44	5	9.8	0.17	9.8	5	0.17
cis-1,3-Dichloropropene	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.4 U	< 0.13 U	0.43	NS	122	0.4	120	NS	0.4
Chlorobenzene	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.5 U	< 0.12 U	91	100	25	110	25	100	110
Chloroethane	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.17 U	21,000	NS	160	4.6	3.9	NS	4.6
Chloromethane	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 UJ	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.17 U	190	NS	294	1.5	3,200	NS	1.5
Chloroform	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.11 U	0.19	80	74	0.17	62	NS	6.2
Dibromochloromethane	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.5 U	< 0.14 U	0.15	80	267	0.13	160	NS	0.13
Ethylbenzene	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.13 U	1.5	700	290	2.9	290	700	2.9
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.68 J**	**0.75**	680	NS	NS	660	NS	NS	NS
Methylene Chloride	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 5 U	< 0.44 U	4.8	5	2,200	4.3	2,200	NS	4.3
Styrene	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.16 U	1,600	100	100	1,600	100	100	1,600
Tetrachloroethene	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.4 U	< 0.15 U	0.11	5	120	0.1	99	5	0.66
Toluene	< 10 U	**1 J**	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	**0.27 J**	2,300	1,000	130	720	130	1,000	720
trans-1,3-Dichloropropene	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 0.4 U	< 0.14 U	0.43	NS	122	0.4	120	NS	0.4
Trichloroethene	< 10 U	< 10 U	**3 J**	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	**0.22 J**	2	5	360	0.0282	74	5	0.0282
Trichlorofluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 U	< 0.20 U	1,300	NS	NS	1,300	NS	NS	1,300
Vinyl Chloride	**6 J**	**9 J**	**9 J**	**7 J**	**8 J**	**6 J**	**5 J**	**4 J**	< 10 U	< 1 U	**1.6**	0.016	2	21	0.02	22	2	0.02
Xylene total	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 UJ	< 10 U	< 10 U	< 10 U	< 1 U	< 0.4 U	200	10,000	100	210	100	10,000	210
Sample EPA ID Numbers[b]	HB543	HC007	HC012	HC016	HC023	HC030	HC042	HC044	HC051 & HC052	TV003 & TV004	BE004	—	—	—	—	—	—	—

Bold = The analyte was detected during laboratory analysis.

µg/L = microgram per liter

DOH = Department of Health, State of Hawaii

EAL = Environmental Action Level

EPA = Environmental Protection Agency, United States

MCL = maximum contamination limit under the Safe Drinking Water Act (40 CFR Part 141)

mg/L = milligram per liter

NA = Not analyzed

PRG = Preliminary Remediation Goal

2010 RSL = November 2010 Regional Screening Level

VOC = volatile organic compound

NA = Not analyzed

NS = No standard

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit QL.

J = The analyte was positively identified; the associated numerical value is the approximate concentration.

UJ = The analyte was not detected, however, the reported QL is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

[a] = cis-1,2,-Dichloroethene

[b] = Results of samples with two EPA ID numbers are reported using the higher concentration of the two samples.

Table B-3: Soil Analytical Data, RAA 11, Subsurface Fuel RI/FS

COC ID	HB755	HB819	HB820	HB821	HB690	HB691	HB692	HB694
Ogden ID	C22-1-MW90-A1-D11.5	A24-1-SP109-A1-D06	A24-2-SP110-D1-D08	A24-2-SP110-A1-D09	B23-1-SP76-A1-D08.0	B21-2-SP77-A1-D09.0	B21-1-SP78-A1-D10.0	B21-3-SP-29-A1-D10.0
Location	MW90	SP109	SP110	SP110	SP76	SP77	SP78	SP79
Depth (bgs)	11.5	6	8.5	9	8	9	10	10
Sampling Date	03/19/96	04/09/96	04/09/96	04/09/96	01/22/96	01/22/96	01/23/96	01/23/96
Analyte	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual
Chloromethane	13.0 U	16.0 U	13.0 U	27.0 UJ	1,300.0 U	11.0 U	180.0 U	27.0 U
Bromomethane	13.0 U	16.0 U	13.0 UJ	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Vinyl Chloride	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Chloroethane	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Methylene Chloride [a]	13.0 U	**8.0** J	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Acetone [a]	**66.0** J	**160.0**	260.0	290.0	1,300.0 UJ	180.0	3,200.0	27.0 UJ
Carbon Disulfide	13.0 U	16.0 U	4.0 J	27.0 U	1,300.0 U	11.0 U	180.0 U	3.0 J
1,1-Dichloroethene	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
1,1-Dichloroethane	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
1,2-Dichloroethene (total)	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Chloroform	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
1,2-Dichloroethane	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
2-Butanone [a]	**14.0** J	16.0 U	37.0	27.0 U	1,300.0 U	11.0 U	180.0 U	19.0 J
1,1,1-Trichloroethane	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Carbon Tetrachloride	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Bromodichloromethane	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
1,2-Dichloropropane	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
cis-1,3-Dichloropropene	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Trichloroethene	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Dibromochloromethane	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
1,1,2-Trichloroethane	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Benzene	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Trans-1,3-Dichloropropene	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Bromoform	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
4-Methyl-2-pentanone	13.0 UJ	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
2-Hexanone [a]	**7.0** J	16.0 U	13.0 U	27.0 U	1,300.0 UJ	11.0 U	180.0 U	27.0 U
Tetrachloroethene	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
1,1,2,2-Tetrachloroethane	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Toluene	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Chlorobenzene	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Ethylbenzene	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Styrene	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U
Total Xylenes	13.0 U	16.0 U	13.0 U	27.0 U	1,300.0 U	11.0 U	180.0 U	27.0 U

Note: All units in µg/kg.
Green highlight indicates estimated data "J" below LOQ.
Yellow highlight indicates detection above LOQ.
[a] Laboratory extraction solvents. Probable laboratory contamination.

Table B-4: Soil Analytical Data, RAA 13, Subsurface Fuel RI/FS

COC Sample ID	HB123	HB124	HB125	HB126	HB155	HB157	HB175	HB176	HB256	HB257	HB660	HB773
Ogden ID	B11-1-B54-A1-D12.5	B11-1-B54-A2-D42.5	B12-1-B17-A1-D7.0	B12-1-B17-A2-D37.0	C10-1-B55-A1-D12.0	C10-1-B55-A2-D24.5	D13-1-B11-A1-D9.5	D13-1-B11-A2-D24.5	F10-1-B47-A1-D4.5	F10-1-B47-A2-D7.0	E13-1-SP47-A1-D13.0	E12-1-MW100-A1-D8.50
Location	B54	B54	B17	B17	B55	B55	B11	B11	B47	B47	SP47	MW100
Depth (ft bgs)	12.5	42.5	7.0	37.0	12.0	24.5	9.5	24.5	4.5	7.0	13.0	8.50
Sampling Date	10/18/1992	10/18/1992	9/15/1992	9/15/1992	10/19/1992	10/19/1992	9/8/1992	9/7/1992	10/12/1992	10/12/1992	1/17/1996	3/25/1996
Analyte	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual
1,1,1-Trichloroethane	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	9 J
1,1,2,2-Tetrachloroethane	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
1,1,2-Trichloroethane	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
1,1-Dichloroethane	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
1,1-Dichloroethene	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
1,2-Dichloroethane	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
1,2-Dichloroethene(total)	12 U	13 U	12 UJ	13 UJ	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
1,2-Dichloropropane	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
2-Butanone	12 UJ	13 U	12 UJ	13 UJ	12 U	13 U	13 UJ	15 J	13 U	13 U	140 U	15 U
2-Hexanone	12 UJ	13 U	12 UJ	13 UJ	12 UJ	13 UJ	13 U	12 U	13 UJ	13 UJ	140 U	15 U
4-Methyl-2-pentanone	12 UJ	13 UJ	7 J	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Acetone	6 J	13 UJ	15 UJ	40 UJ	12 UJ	13 UJ	20 UJ	130 U	27 J	11 J	180 UJ	38 UJ
Benzene	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Bromodichloromethane	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Bromoform	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Bromomethane	12 U	13 U	12 U	13 U	12 U	13 U	13 UJ	12 UJ	13 UJ	13 UJ	140 UJ	15 U
Carbon Disulfide	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Carbon Tetrachloride	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Chlorobenzene	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Chloroethane	12 U	13 U	12 UJ	13 UJ	12 U	13 U	13 UJ	12 UJ	13 U	13 U	140 U	15 U
Chloroform	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Chloromethane	12 U	13 UJ	12 U	13 U	12 UJ	13 UJ	13 U	12 U	13 UJ	13 UJ	140 U	15 U
Cis-1,3-dichloropropene	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Dibromochloromethane	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Ethylbenzene	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Methylene Chloride	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Styrene	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Tetrachloroethene	12 U	13 U	38 U	14	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Toluene	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Trans-1,3-dichloropropene	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Trichloroethene	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	130 J	15 U
Vinyl Chloride	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U
Total Xylenes	12 U	13 U	12 U	13 U	12 U	13 U	13 U	12 U	13 U	13 U	140 U	15 U

Green highlight indicates estimated data "J" below LOQ.

Yellow highlight indicates detection above LOQ.

bgs = below ground surface

COC = chain of custody

ft = foot/feet

ID = identification

J = The analyte was positively identified; the associated numerical value is the approximate concentration.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit QL.

UJ = The analyte was not detected, however, the reported QL is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Attachment C
Responsiveness Summary

Table C-1: Responses to Public Comments

Comment No.	Question/Comment
Questions and Comments Received During the Proposed Plan Public Meeting (01 November 2011) for RAA 11 and RAA 13	
1	Mr. Robert Harter (City and County of Honolulu) asked what was the potential source.
Mr. Joel Narusawa (U.S. Navy, NAVFAC Hawaii) responded that no source has been identified, despite the installation of other monitoring wells nearby. However, he also noted that concentrations are decreasing, that downward trends are observed at both RAA 11 and RAA 13.	
2	Mr. Ron Mobley (General Public) inquired about the schedule, noting that while the public comment period for the proposed plan would close within a few days, the record of decision would not be completed until January 2013, and asked why so long to close out the site.
Mr. Narusawa responded that it was an estimated completion date. Ms. Janice Fukumoto (U.S. Navy, NAVFAC Hawaii) followed up by stating that it [i.e., the record of decision] is a different document, noting that the proposed plan only proposed the recommended final alternative while the record of decision actually documents the final alterative as the decision. Ms. Fukumoto added that as the site is on the National Priorities List, there are multiple agencies that are involved, and that need to review the documents -- U.S. EPA, Hawaii Department of Health, and the Navy -- and that the reviews will be both technical and legal. Mr. Narusawa added that legal review consisted of multiple attorneys from both the Navy and EPA.	
3	Mr. Ron Mobley directed Mr. Narusawa to a slide that graphed detected vinyl chloride groundwater chemical concentrations over time for RAAs 11 and 13 and asked why the concentration had dipped below 20 [µg/L], then increased to 50 [µg/L].
Mr. Narusawa responded that it's not always known why this occurs, noting that sometimes it is the movement of the groundwater or the effect of precipitation infiltration which may stimulate contaminant movement. Mr. Narusawa asked if it was known whether 1998 was a year of high precipitation, to which Mr. Scott Lewis (AECOM) responded that groundwater monitoring had not been taking place for very long [between December 1995 and September 1997], so that one might not be able to discern a trend. Mr. Ron Mobley stated that those initial points appeared to be an upward trend. Mr. Lewis responded that while it may appear to be an upward trend, the number of data points was low, which was why groundwater monitoring was continued for 10 years, so as to better understand potential data trends. He added that upon reviewing additional monitoring data, the trend is noticeably downward, to where concentrations drop below the level of concern in 1999. Mr. Narusawa added that it was important to note the low concentrations that are being discussed, in parts -per -billion.	
4	Mr. Ron Mobley pointed to graphs of RAA 13 vinyl chloride groundwater chemical concentrations noting that early on the graph was flat, but that from December 2003 to 2005, concentrations increased, and asked how can it be stated that concentrations are going down when there are spikes. He added that he had the same concern with RAA 11.
Ms. Fukumoto replied that while the spike did happen for RAA 11, the concentration spike is half of what the original concentration was 10 years ago. For RAA 13, the spike is even less than that.	
5	Mr. Harter asked what is a typical source of vinyl chloride.
Mr. Narusawa answered that vinyl chloride might be a breakdown product from something else such as trichloroethylene. Ms. Fukumoto added that it is a solvent, and that the potential sources of solvents were spills which potentially caused contamination in the two areas.	
6	Mr. Harter followed up with a question that if better safety practices had been employed, would this have been a problem.
Ms. Fukumoto responded that better safety practices are being employed, and that wherever it took place, it is not being continued or repeated.	
7	Mr. Mobley followed up on his earlier line of questioning regarding concentration spikes and precipitation, noting that if a source were in the soil rather than groundwater, that increased precipitation would generate the concentration spikes in groundwater.
Mr. Narusawa responded that overall, the concentration gradient is flat, and if there were a potential for increases due to the presence of a remaining source, it would have been seen by now. He added that the main point to be relayed is that the present concentrations are well below the environmental action level.	
8	Mr. Harter asked what was the initial cause that prompted the initiation of groundwater monitoring.
Mr. Narusawa replied that it was an offshoot of the subsurface fuel investigation that took place in the 1990s. Ms. Fukumoto then describes the history and scope of the subsurface fuel investigation.	
9	Mr. Harter asked whether monitoring wells were in existence to monitor for potential contamination.
Ms. Fukumoto replied that the monitoring wells were installed for the subsurface fuel investigation.	